CLAIMS:

1. A method of forming a composite wire having a diameter greater than about 15 microns and less than about 100 microns and consisting of a gold alloy annulus surrounding a wire core comprising an electrically-conductive non-noble metal, said method comprising:

assembling a composite billet consisting essentially of a core of said non-noble metal, an intermediate layer of said gold alloy and an outer metal layer;

extruding said composite billet with force to form a composite rod comprising corresponding core, intermediate and outer metal layers, wherein the core fraction measured by cross-sectional area of the cylinder defined by the core and intermediate layer of said rod is essentially the same as the corresponding core fraction of said billet;

removing said outer metal layer of said composite rod;

drawing said composite rod to form a first composite wire having a diameter between about 0.5 and about 5 mm and a core fraction essentially the same as said core fraction of said composite rod; and

drawing said first composite wire to form a second composite wire having a diameter between about 15 and about 100 microns and a core fraction essentially the same as said core fraction of said first composite wire.

2. The method of claim 1, wherein said core metal comprises copper.

3. The method of claim 2, wherein said core metal consists essentially of copper.

4. The method of claim 1, wherein said gold alloy is at least 99% gold.

5. The method of claim 4, wherein said gold alloy comprises gold doped with less than 30 ppm calcium, less than 20 ppm beryllium and less than 50 ppm other elements.

6. The method of claim 5, wherein said gold alloy comprises gold doped with less than 10 ppm of beryllium and less than 10 ppm of calcium.

7. The method of claim 1, wherein said core metal and said gold alloy have melting temperatures within a range of 5°C.

8. The method of claim 1, wherein said billet has a core fraction between about 25 and about 95% by cross-sectional area.

9. The method of claim 1, wherein said billet is preheated to a temperature between about 200 and about 700°C prior to extrusion.

10. The method of claim 1, wherein said billet is extruded with a force between about 50 and about 200 kg/mm^2.

11. A composite wire, having a micron-dimensioned diameter, formed by the method of claim 1.